12/14/15 "The catching ends the pleasure of the chase" - Abraham Lincoln

HW: "Using the Quadratic Formula" w/s #2-16 even
Test 2 on Tuesday 12/22

$a^5 \cdot a^5 \cdot a^5 = a^{15}$

AIM: How do we solve quadratic equations that are not factorable?

Warm Up:

1) The expression $\sqrt[3]{64a^{16}}$ is equivalent to

(1) $8a^4$

(2) $8a^8$

(3) $\boxed{4a^5\sqrt[3]{a}}$

(4) $4a\sqrt[3]{a^5}$

$\sqrt[3]{64a^{16}}$

$\sqrt[3]{64a^{15}} \quad \sqrt[3]{a^1}$

$4a^5 \quad \sqrt[3]{a}$

2) The answers to a quadratic equation are called:

(1) roots

(2) zeroes

(3) solutions

(4) all of the above

3) What are the roots of the following:

$x^2 + 3x = -2$

$x^2 + 3x = -2$
$+2 \quad +2$
$x^2 + 3x + 2 = 0$
$(x+1)(x+2) = 0$
$x = -1 \mid x = -2$

$\left(\frac{3}{2}\right)^2 = \frac{9}{4}$

$x^2 + 3x + \boxed{\frac{9}{4}} = -2 + \boxed{\frac{9}{4}}$

$\pm\sqrt{\left(x + \frac{3}{2}\right)^2} = \pm\sqrt{\frac{1}{4}}$

$x + \frac{3}{2} = \pm\frac{1}{2}$
$-\frac{3}{2} \quad -\frac{3}{2}$

$x = -\frac{3}{2} \pm \frac{1}{2}$

$x = -\frac{3}{2} + \frac{1}{2} = -1$

$x = -\frac{3}{2} - \frac{1}{2} = -2$

4) $Solve: \; 3x^2 - 10x + 5 = 0$

Quadratic Formula:
For $ax^2 + bx + c = 0$,

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$\overset{a}{3}x^2 - \overset{b}{10}x + \overset{c}{5} = 0$

$a = 3$

$b = -10$

$c = 5$

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(3)(5)}}{2(3)}$$

$\sqrt{40}$
$\sqrt{4}\sqrt{10}$
$2\sqrt{10}$

$$x = \frac{10 \pm \sqrt{40}}{6} = \frac{10 \pm 2\sqrt{10}}{6}$$

$$\boxed{\frac{5 \pm \sqrt{10}}{3}}$$

$\frac{5+\sqrt{10}}{3}$ AND $\frac{5-\sqrt{10}}{3}$

5) $Solve: \ x^2+4x+5=0$

$a=1 \quad b=4 \quad c=5$

$$x=\frac{-4\pm\sqrt{4^2-4(1)(5)}}{2(1)}$$

$$x=\frac{-4\pm\sqrt{-4}}{2}$$

$$\frac{-4\pm2\sqrt{-1}}{2}$$

$$-2\pm\sqrt{-1}$$

Complete the Square

$$x^2+4x+\boxed{4}=-5+\boxed{4}$$

$$\pm\sqrt{(x+2)^2}=\pm\sqrt{-1}$$

$$x+2=\pm\sqrt{-1}$$

$$-2 \quad -2$$

$$x=-2\pm\sqrt{-1}$$